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teenth century. But the credit belongs to the unknown chemist who invented the process of making paper. The ancient Romans stamped their bricks and lead pipes with type, but printing had to wait more than a thousand years for a supply of paper. Movable type is not the essential feature of printing, for most of the printing done nowadays is not from movable type, but from solid lines or pages. We could if necessary do away with type and press altogether, and use some photographic method of composition and reproduction, but we could not do without paper. The invention of wood-pulp paper has done more for the expansion of literature than did the invention of rag paper 600 years ago.

Print is only an imperfect representation of the sound of speech, a particularly imperfect representation in the case of English because we can not tell how half the words sound from their spelling. But the phonograph gives us sounds directly, and the audion and the radio have extended the range of a speaker, until now a speaker may have an audience covering a continent and including generations yet unborn. What these inventions do for sound, photography has done for the sister sense of light. By means of them man is able to transcend the limitations of time and space. He can make himself seen and heard all round the earth and to all future years.

THE COST OF NIAGARA

If a man stood on the banks of the Mississippi at the time of the spring freshet, when the stream was carrying down to the Gulf fences, pigs, chickens, furniture and, occasionally, a house, he would be seriously concerned over the loss of the property of those who had so little to lose, and perhaps exert himself to save some of it; but the continuous calamity of Niagara arouses in him no feelings of a nature to mar his

enjoyment. He shows the same æsthetic appreciation of a sublime and beautiful spectacle and the same indifference to its cost as Nero at the burning of Rome.

It is easier to comprehend how much it is costing us to keep up Niagara as a spectacle if we put the waste in concrete terms. Various engineers have estimated that it would be possible to get from Niagara Falls over 5,000,000 more horse-power than is now utilized. In one of the large steam plants of New York City the cost of power is \$50 a year per horse-power. Taking these figures as sufficiently close for our purpose the water that goes over the Falls represents the annihilation of potential wealth at the rate of some \$250,000,000 a year or nearly \$30,000 an hour.

We are told that there are some millions of people in poverty and poorly nourished in this country, yet here is wasted the equivalent of 250,000 loaves of bread an hour. We may see with our mind's eye 600,000 nice fresh eggs dropping over the precipice every hour and making a gigantic omelet in the whirlpool. If calico were continuously pouring from the looms in a stream 4,000 feet wide like Niagara River it would represent the same destruction of property. If a Carnegie Library were held under the spout it would be filled with good books in an hour or two. Or we can imagine a big department store floating down from Lake Erie every day and smashing its varied contents on the rocks 160 feet below. That would be an exceedingly interesting and diverting spectacle, quite as attractive to the crowd as the present, and no more expensive to maintain. Yet some people might object to that on the ground of extravagance who now object to the utilization of the power of the falling water.

It must not be supposed that I am insensible to the beauties of nature or ignore their æsthetic and cultural

value. On the contrary, I would wish to enhance the interest and impressiveness of Niagara Falls by making it a rarer spectacle. The reason why people fail to appreciate the beauty of the clouds, of the sunset and of the landscape from their windows is because these are so common. If a bouquet of fireworks were shot off at eight o'clock every night we would not care to look at them. Of course the Falls would be turned on for all legal holidays and as often as there was sufficient demand for it. On such occasions those who wished to go down the current in barrels could enjoy their favorite sport. Weddings would naturally be arranged to come off at a time when the Falls fell. At the hours when the water was prohibited from making a run on the banks, rambles over the eroded rocks and worn channels would be of great interest to the geologist and the tourist. Couples and groups could be photographed at the Falls then, as they are now, by posing them in front of a painted screen.

Many more people would see Niagara and their enjoyment of it would be much greater if it could be seen only on fete days. Thinking they could see it any time, thousands of people have neglected it in favor of some passing show.

Of course, there is something impressive in the thought that the flood pours thundering into the abyss all of the time regardless of sight-seers. But if one has not sufficient imagination to find an equal emotional value in the contemplation of the varied life and industry it supports as it pours through the penstocks and spins the turbines he can swell with satisfaction on the thought of the thousands of years when it was of no use to anybody.

In 1893, when Lord Kelvin stood on the brink of Niagara, he was not so much impressed by its grandeur as he was saddened by the sight of such an enormous waste of power,

and he expressed the hope that he would live to see it all utilized, an observation which was much ridiculed at the time by hard-hearted sentimentalists and unimaginative poets. To them Niagara was a mere spectacle, but to the great scientist, who had devoted his life to the study and exposition of the law of the conservation of energy, it was much more. His prophetic eye could see the poor who might be enriched, the homes that could be made happy, the hungry who might be fed, the naked who might be clothed, and the toiling millions who might be relieved of their burdens by the water dashing upon the rocks below for the amusement of idle tourists.

LOOK OUT FOR ALPHA CENTAURI

As if we did not have enough to worry about, what with winter coming on and coal so short and clothing so high, here comes along Professor Ellsworth Huntington, of Yale, with a book on "Climate Changes" which warns us that the stars in their courses may fight against us. He has a theory that the glacial epochs and the lesser disturbances of the earth's climate are largely due to prior disturbances in the sun's atmosphere and these in turn may be caused by the approach or increased activity of certain stars. All the stars, including our sun, are in radio communication with one another, and when one flares up over something it arouses responsible excitement in all the others within range. Then, too, the stars are not "fixed," as we used to think, but are wandering about in various directions, and when two stars come close enough together they become mutually inflamed by the proximity and may become permanently attached.

Now the nearest star to us is the brightest one in the Centaur constellation, therefore named Alpha Centauri. It is only about 25 trillion